Using CensusAtSchool as a business education resource

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CensusAtSchool is an educational project that provides students with access to real, raw online data about themselves. The project is designed for students in Years 5 to 12 and aims to improve their statistical literacy. This article includes further information about the project and sample activities based on CensusAtSchool data. This resource provides opportunities for learning across a range of VELS domains, including Humanities–Economics, Civics and Citizenship, and ICT.

Increasingly, students are faced with an overwhelming abundance of data and information; hence, the ability to extract relevant data and process appropriate information for evidence-based decision-making is very important.

About CensusAtSchool

The Australian Bureau of Statistics (ABS) introduced the CensusAtSchool project in 2005. CensusAtSchool is a free and voluntary data collection and analysis project available to every student in Australia. It aims to strengthen students' data-handling and information-processing skills by engaging them with data about themselves and their peers. Using MS Excel, students turn raw data into information that makes sense, allowing them to build a real picture of the world around them.

The project is conducted in two phases. In the Questionnaire Phase students respond to non-invasive questions about themselves via the CensusAtSchool online questionnaire. The student response data is pooled into a nation-wide database, but schools must register to be part of the database. In 2008, over 44 000 completed the online questionnaire. In response to feedback from teachers, a financial literacy component was included in the 2008 questionnaire. This forms the basis for two of the student activities presented on the following pages.

The Data Usage Phase then enables teachers and students to access the questionnaire response data to carry out meaningful investigations in an engaging learning environment. The Data Usage phase is open on an ongoing basis and is freely available to all teachers and students. The data data provides an indication, not a representation, of Australian students, which the ABS hopes gives students the motivation to work with the data. The most recent data available was collected in 2008, with the next live Questionnaire Phase scheduled for 2010.

Using CensusAtSchool in the classroom

For CensusAtSchool 2008, the students who submitted a questionnaire can be thought of as a population. The CensusAtSchool database provides access to Australian data about gender, birth dates, state or territory of residence, languages spoken, computer and Internet use, school, lifestyle, earnings such as weekly income and the source, leisure activities, favourite types of music, favourite sports, family holidays, and opinions and actions on important environmental and social issues. The website also provides access to an international CensusAtSchool database, allowing international comparisons.

Students can pose their own questions for analysis, use the following activities to analyse the data, or use activities available on the CensusAtSchool website.

The data can be used to investigate:

- time spent on paid work/homework/family and a range of other activities (Economics, Level 4)
- spending decisions (Economics, Level 4)
- student weekly income—amount and source (Economics, Level 5)
- buying and selling on the Internet (Economics, Level 5).

In addition, CensusAtSchool data can be used for investigations relating to:

- different types of market surveys, for example technology use at home, or likely demand for a new product—for example a new breakfast food or a sports product designed for teenagers, or existing products such as package holidays (Economics, Level 5)
- how markets operate (Economics, Level 5)
- the relationship between work and leisure (Economics, Level 4)
- people's needs and wants (Economics, Levels 4–6)
- the relationship between scarcity, opportunity cost, choice and resource allocation (Economics, Level 5)

- economic issues such as the use of scarce resources like water and energy (Economics, Level 5; Civics and Citizenship, Levels 5 and 6)
- contemporary and social issues (Civics and Citizenship, Levels 5 and 6)
- resource use and economic sustainability (Economics, Level 6)
- the role of values in economic decision-making (Economics, Level 6).

Ready-to-use classroom activities are available on the CensusAtSchool website. Each activity has a student worksheet, simplified data sample, and table of data. Activities with economics elements include ones on water management, producing different Christmas brochures for different types of communities for a company, and leisure time patterns among Australian students. Activities with civics elements focus on environmental and social issues.

You can visit the CensusAtSchool website at <www.abs.gov.au/censusatschool>. All project support materials can be found in the Teacher Area of the website. This area includes a data section, a teacher professional development section containing online tutorials in video format, and integrated classroom activities.

The Student Area contains a sample of the CensusAtSchool questionnaire and a Random Sampler of data. Using drop-down lists, this facility allows you to produce randomly generated datasets based on criteria such as reference year (2006 or 2008), sample size, postcodes, preferred year levels of students, and gender. The data is provided in an Excel file. The Random Sampler is also accessible from the Teacher Area, along with prepared data samples and information tables. An important strength of CensusAtSchool is that the data can be downloaded into spreadsheets, data visualisation software and graphics calculators.

Further information

If you have any queries or suggestions, please contact ABS Education Services on 1800 623 273 or email <education@abs.gov.au>.

INTRODUCTORY STUDENT ACTIVITIES

An introductory activity titled 'Generate a random sample as an Excel workbook' is one of five activities that will give you basic skills needed to use MS Excel. This activity shows how to generate and save a random data sample. The other introductory activities focus on selecting required data, sorting data and using formulas, summarising data into a table format, and drawing graphs. These can be found in the Teacher Area of the CensusAtSchool website. Go to <www.abs.gov.au/censusatschool> and click on → *Teacher Area* → *Classroom Activities*.

ACTIVITY 1: SOURCES OF INCOME

Go to the CensusAtSchool website <www.abs.gov.au/censusatschool> and click on → *Student Area* → *Random Sampler*.

Select the reference year 2008 and generate a sample of 200 students and simplify your worksheet to include only the following variables: gender (Q1), year of birth (Q2), state of residence (Q4), income source (Q29) and amount (Q30), time spent on the Internet (Q34), leisure and sporting activities (Q33 and Q36 respectively).

Conduct the following investigations using MS Excel.

Part 1: Average income

a What is the median and mean weekly income of your sample of students?

b Which measure is a better representation of your sample's average income? Explain your answer.

c Conduct your own class survey by downloading the 2008 Questionnaire from the Student Area of the CensusAtSchool website, and compare your class median/mean weekly income with your sample.

Part 2: Sources of income

d Out of the five sources indicated, which source of income pays the highest (that is, paid work, allowance, chores, and so on)? Would your answer be different when considering mean and median weekly incomes?

e What is the most common source of income for students in your sample?

f Conduct a socioeconomic investigation by combining income sources with other variables including age, gender and location. Are there any trends/relationships arising from the data? For example, do boys in your sample get more money than girls? Does time spent on sporting or leisure activities affect the level of income earned?

g Extend the investigation to examine the potential opportunity costs of the paid income source of your sample of students: are students in paid work spending less time on homework/family/housework?

Other possible inquiry topics include:

- Are students who make/receive higher incomes more likely to buy/sell on the Internet?
- How does my state's average/median income compare with other states and territories?
- Choose your own investigation.

ACTIVITY 2: MARKETING SURVEYS

Go to the CensusAtSchool website <www.abs.gov.au/censusatschool> and click on → *Student Area* → *Random Sampler*.

Select the reference year 2008, set your postcode range to your state/territory (e.g. 3000–3999 for Victoria) and generate a sample of 200 students. Simplify your worksheet to include only the following variables: gender (Q1), year of birth (Q2), state of residence (Q4), favourite take-away food (Q27) and breakfast foods (Q28), leisure activities (Q33), pets owned (Q20), favourite sports (Q36), holidays (Q37), and opinions about environmental and social issues (38 and Q39 respectively).

Conduct the following investigations using MS Excel.

a Why is it important to have a large sample when conducting market research?

b Of the social issues indicated, which is regarded as the most important to students in your sample? Graph the results. Is the answer different for boys only compared to girls only?

c Which environmental issue is regarded as the most important to students in your sample? Graph the results. Is the answer different for boys only compared to girls only?

d In what ways could your answers to **2b** and **2c** above be used for marketing purposes?

e Which type of take-away food outlet would have the highest chance of succeeding in your state/territory, based on the data in your sample. Explain your answer.

f Prepare a graph that shows the types of pets most commonly owned in Victoria. What three types of pets would you recommend a pet shop in Victoria offer for sale?

g Prepare a graph that highlights the most popular sports in Victoria. Describe the results. Which organisations would be interested in this information? Explain your answer.

h Which type of holiday should your local travel agent devote most resources to in promotions aimed at Victorians: holidays within Victoria, holidays interstate or holidays overseas? Explain your answer.

i What are some of the data limitations of your sample that should be considered if you were to make decisions based on your research?

ACTIVITY 3: INCOME AND GENDER

Look at a sample of weekly earnings (paid work) of students in Australia and calculate the mean and median income for boys and girls. Then analyse the average Australian weekly earnings for males and females, across different industries.

Go to the CensusAtSchool website <www.abs.gov.au/censusatschool> and click on → *Student Area* → *Random Sampler*.

Select the reference year 2008 and generate separate samples of 100 girls and 100 boys from the Random Sampler. Simplify your sample to include the following variables only: gender (Q1), money source (Q29), and amount of income received (Q30).

Conduct the following investigations using MS Excel.

a Graph mean and median incomes for boys and girls. Explain what the graph shows.

b Compare your findings with Australian male and female average weekly earnings. Are the same trends evident? To locate this data, go to the Education Services website at <www.abs.gov.au/teachers> and click on → *ABS Datasets* → *Economic Datasets*. Choose *Dataset E5: Full time employee total earnings by industry by sex*. Use the figures for 'All industries'.

c Look at income by gender for different industries. Which five industries offer the highest weekly earnings for males and females? Use the most current figures.

d Calculate the percentage change in weekly earnings for 'All industries', from 2002 to 2006, for males and females. Which gender has experienced the largest percentage change in average full-time weekly income over the given period?

Highest female average full-time weekly earnings by industry, May 2006